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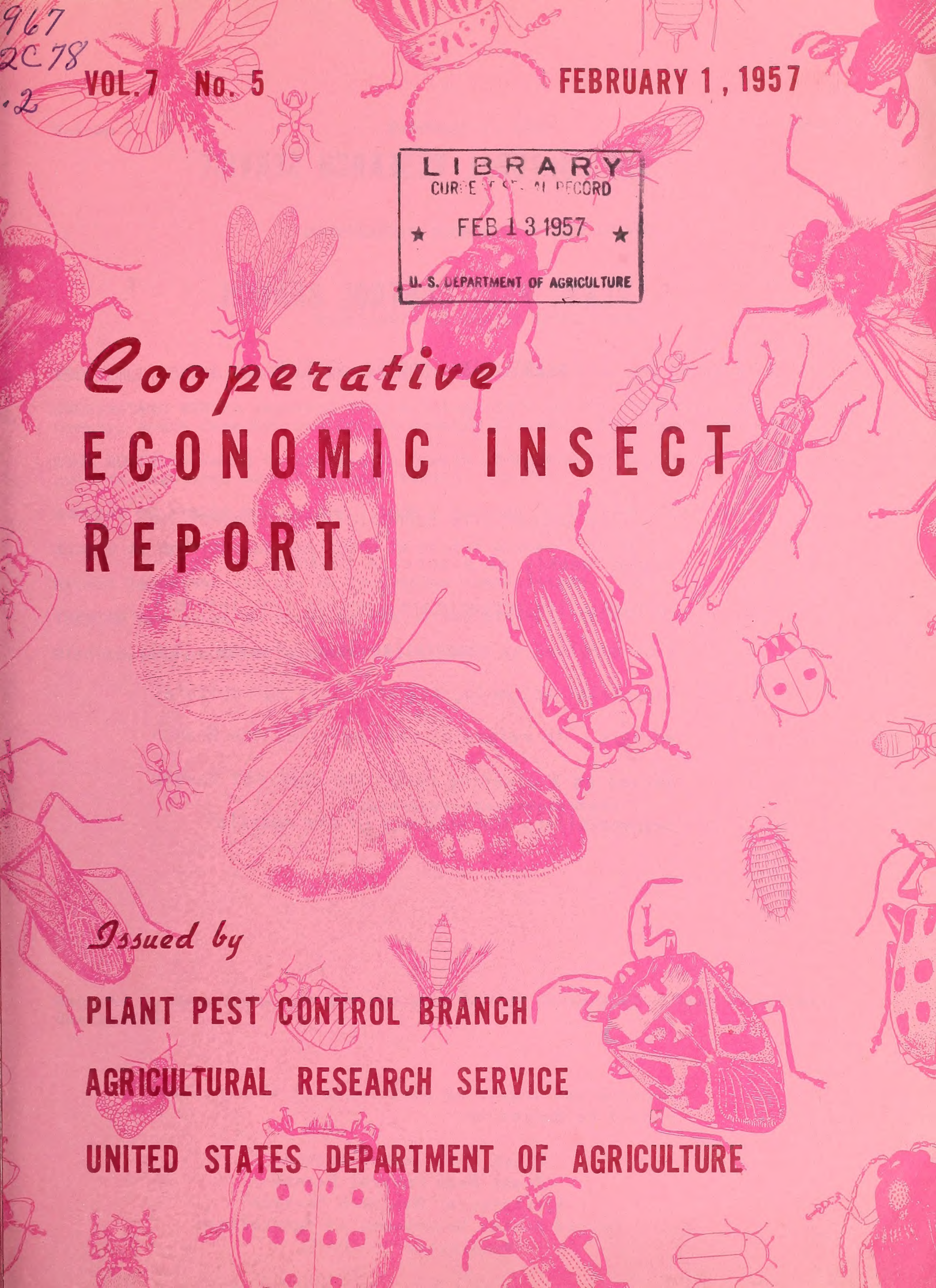

Cooperative ECONOMIC INSECT REPORT

Issued by

PLANT PEST CONTROL BRANCH
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL BRANCH

PLANT PEST SURVEY SECTION

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Branch serves as a clearing house and does not assume responsibility for accuracy of the material.

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Volume 7 February 1, 1957 Number 5

COOPERATIVE ECONOMIC INSECT REPORT

Highlights of Insect Conditions

VEGETABLE WEEVIL damaging crucifers in South Carolina and Georgia. (p.76).

SWEETPOTATO WEEVIL reported from Appling and Brantley Counties, Georgia; Jasper County, South Carolina and Coffee County, Alabama. New county records. (p.76).

PINK BOLLWORM found in Washington County, Arkansas; only newly-infested county outside regulated area this past season. (p.76).

SUMMARY OF INSECT CONDITIONS - 1956 - Indiana (p.79), Oklahoma (p.80).

Status of SPOTTED ALFALFA APHID in United States. (p.85).

Recent important changes in Trogoderma nomenclature. (p.78).

INSECTS not known to occur in the United States. (p.88).

Distribution of RANGE GRASSHOPPERS. (p.89).

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Reports in this issue are for the week ending January 25 unless otherwise designated.

WEATHER OF THE WEEK ENDING JANUARY 28, 1957

The principal weather features of the week were extreme cold in the northwestern and north-central portions of the country with freezing temperatures reaching to Santa Maria on the southern coast of California and subzero readings into southern Kansas; light snow flurries at Los Angeles and heavy snowfalls of more than 2 feet in the Southern Plateau and Rocky Mountain regions, 1.72 inches of precipitation at Blanding, Utah, and other heavy or moderate accumulations in nearby drought areas; storms of sleet and glaze extending from the southern and central Great Plains into the lower Great Lakes region; tornadoes striking in Oklahoma and eastward to Kentucky; heavy rainfalls in the lower Arkansas, Tennessee, and Ohio Valleys; and "January thaws" followed by colder weather in the Northeast. These events occurred in a weather pattern of Arctic air masses, which penetrating into the country both east and west of the Continental Divide, came in contact with warm, moist conditions covering the East and South. Temperatures averaged 9° or more below normal throughout the northwestern quarter of the Nation with Helena, Montana observing a departure of -36° and reporting the coldest week in 77 years. At Missoula, Montana and Pendleton, Oregon record low temperatures were reported on the 26th, a -31° in 64 years and a -22° in 21 years, respectively. Other low temperatures reported were -41° at Ukiah, Oregon; -39° at Great Falls, Montana; -34° at International Falls, Minnesota; and -31° at Danbury, Wisconsin. East of a line extending from Port Arthur, Texas, to Rochester, New York temperatures this week averaged above normal as they also did in eastern Arizona and western New Mexico. As cold air replaced the existing warmer conditions in the East many sharp changes in temperature were felt, such as the one which occurred at Oneonta, New York where 58° was observed on the 23rd and 1° on the following day. Heavy to moderate precipitation totals were recorded this week east of a line extending from Port Arthur to Wichita Falls, Texas, thence northeastward to Alpena, Michigan, also along the central West Coast and in a small area where the States of Utah, Colorado, Arizona, and New Mexico adjoin. Heavy local showers in the Palm Beach and Martin Counties Florida area the 21st flooded some areas with 3 to 15 inch falls in 24 hours, and 2.26 inches at Buffalo, New York was a record 24-hour fall for that station for the month of January.

Although the warming trend which extended through the 23rd caused considerable decrease in snow depths and a recession of the snow cover in the East, new falls have replenished some of this loss. The southern limit of snow cover now extends generally from central Kansas, northeastward to coastal New Hampshire. At lower elevations in the extreme northern interior depths now range from 2 to 4 inches in North Dakota to as much as 57 inches at Houghton, Michigan, while at higher elevations in the West measurements include 136 inches at Mount Baker Lodge, Washington; 55 at Fox Park, Wyoming; 75 at Crater Lake, Oregon; 46 at west Yellowstone, Montana; and 24 inches at Red River, New Mexico.

The warming trend also led to reports of some ice breakup and flooding in rivers of western, central and southern New York counties, and ice jams in major rivers of Connecticut. Ice thickness reports this week include 22 inches at Escanaba, Michigan; 26 inches at Bismarck, North Dakota; 16 inches at La Crosse, Wisconsin, and 12 inches at Minneapolis, Minnesota. (Summary Supplied by U.S. Weather Bureau).

CEREAL AND FORAGE INSECTS

SPOTTED ALFALFA APHID - CALIFORNIA - One light and one heavy infestation inalfalfa in Butte City area, Glenn County. (Cal. Coop. Rept., Jan. 18). ARIZONA - Very light infestations in 40-60-acre alfalfa fields east of Mesa, Maricopa County, Jan. 17. A few winged forms present. Population apparently starting to build up. Hippodamia convergens very active in heavily-infested alfalfa fields in Yuma area. Mating of beetles noted Jan. 22. (Ariz. Coop. Rept.). TEXAS - Light to medium infestations on seedling alfalfa in Brazos and Burleson Counties. (Randolph). OKLAHOMA - Limited activity with counts week of Jan. 18 in east and central counties generally light (300-4500 per square foot of alfalfa crown). Extremely light in panhandle counties and light populations (up to 600 per square foot of alfalfa crown) in northwestern counties, week of Jan. 25. (Coppock). Light in Pontotoc and Tillman Counties, January 18. (Meharg, Hatfield, Thomas).

APHIDS - SOUTH CAROLINA - Rather severe infestation in small grain and causing yellowing in Saluda County, Dec. 7. (Craven). Heavy infestation in Orangeburg County, Dec. 5. (Kearse). ARIZONA - No aphids appearing in barley in Mesa area, Maricopa County, January 17. (Ariz. Coop. Rept.).

WINTER GRAIN MITE (Penthaleus major) - OKLAHOMA - Infestations light to heavy in a few oat fields in Rogers County with some damage. (Coppock, Jan. 18).

BROWN WHEAT MITE (Petrobia latens) - OKLAHOMA - Heavy in a few fields of wheat in Enid area. (Owen, Jan. 18). General, light infestation in wheat in Garfield and Kingfisher Counties. (Coppock, Owens).

ARMY CUTWORM (Chorizagrotis auxiliaris) - OKLAHOMA - Light, scattered infestation in Garfield and Kingfisher Counties. All larvae early instars. (Coppock, Owens).

ALFALFA WEEVIL (Hypera postica) - VIRGINIA - Eggs present in large numbers in alfalfa stems or straw from sweepings Jan. 7-12 in some eastern counties. Eggs hatched in two days in incubator at 25°C. (Evans).

FRUIT INSECTS

MEDITERRANEAN FRUIT FLY (Ceratitis capitata) - FLORIDA - No new counties found infested. Six recurrences and 10 new infestations reported from nine counties. Total number of traps in operation is 45,379. New lure, ENT 21478 now being used in 17 counties. (PPC, So. Reg., Dec. 1-31).

MEXICAN FRUIT FLY (Anastrepha ludens) - TEXAS - Two adults trapped in Rio Grande Valley, one in Hidalgo County, Dec. 19 and one in Cameron County, Dec. 28. In Hidalgo and Willacy Counties, 380 traps were added to existing number in operation. (PPC, So. Reg., Dec. 1-31).

CITRUS BLACKFLY (Aleurocanthus woglumi) - TEXAS - No infestations found in inspections in Hidalgo and Cameron Counties during December. (PPC, So. Reg.).

FLORIDA RED SCALE (Chrysomphalus aonidum) - FLORIDA - Activity increased sharply week of Jan. 18 and further increase expected. (Pratt, Thompson, Johnson).

APHIDS - FLORIDA - Infestations increasing on citrus and likely to become common this year. (Pratt, Thompson, Johnson, Jan. 18).

COTTONY-CUSHION SCALE (Icerya purchasi) - ARIZONA - Small numbers in some groves of grapefruit east of Mesa, Maricopa County, Jan. 17. One to two live specimens per infested twig. (Ariz. Coop. Rept.).

BURROWING NEMATODE (Radopholus similis) - FLORIDA - During December, 21,214 root samples were collected from 195 groves, 289 citrus nurseries, 25 ornamental nurseries and 58 dooryard plantings in 14 counties. Laboratory examinations were made of 20,088 samples and 892 were determined as positive. Forty properties were found infested for the first time including 21 groves, 15 citrus nurseries and four ornamental nurseries. These new infestations were located in Polk, Highland, Orange, Lake, Dade and Hardee Counties. (PPC, So. Reg., Dec. 1-31).

PECAN NUT CASEBEARER (Acrobasis caryae) - OKLAHOMA - Survey of the terminal six inches of 200 pecan branches in one orchard in Okemah area showed no overwintering hibernacula. (Coppock, Jan. 18).

OLIVE SCALE (Parlatoria oleae) - CALIFORNIA - Heavy infestation in Butte City, Glenn County. Two commercial orchards a mile southeast of Butte City also heavily infested. A trace infestation at Afton. First finds in that area of Glenn County east of the Sacramento River. (Cal. Coop. Rept., Jan. 18).

TRUCK CROP INSECTS

GREEN PEACH APHID (Myzus persicae) - OKLAHOMA - Light on winter spinach in Bixby area, averaging 103 per leaf. (Coppock).

VEGETABLE WEEVIL (Listroderes costirostris obliquus) - SOUTH CAROLINA - Damaging turnips in Greenville County, Jan. 17. (Jones). Heavy damage to turnips in Dillon County. (Sellers). GEORGIA - Heavy infestations on turnips in Meriwether, Fayette and Jefferson Counties. (Beckham, Johnson). Moderate infestations on turnips, collards and onions in Dodge County, Jan. 18. (Bennett).

LOOPERS - CALIFORNIA - Large numbers of loopers collected from beans, cauliflower, cabbage, Chinese cabbage and lettuce in San Diego and Orange Counties to determine species involved in outbreaks in southern part of State. Trichoplusia ni predominates in specimens identified to date. Autoplusia egena and T. ni were collected from beans. T. ni identified from tobacco. (Cal. Coop. Rept., Jan. 18).

SWEETPOTATO WEEVIL (Cylas formicarius elegantulus) - GEORGIA - Light infestations in Appling and Brantley Counties. New counties infested. (Blasingame, Jan. 18).

Sweetpotato Weevil Situation, Southeast, December, 1956

Surveys showed 449 new infestations in the six cooperative states. Infestation for the first time in Jasper County, S. C. and Coffee County, Ala. These counties adjoin other previously-infested counties. From October through December, 1165 new infestations were found compared with 1608 new infestations during the corresponding period in 1955 or a reduction of 27 percent in new finds. Total number of active infestations was reduced by seven percent during the year. (PPC, So. Reg.).

COTTON INSECTS

Pink Bollworm Situation

One infestation found in gin trash in Washington County, Arkansas . This is the only newly-infested county outside of the quarantine area this season. In TEXAS , infestations in El Paso Valley are heavier than ever before; in Presidio Valley and in much of Pecos Valley area, infestations lighter than for a number of years; in Lubbock area, infestation was more general and heavier than ever before. Childress County in the Amarillo district also showed a heavier infestation. Okra inspections in Cameron Parish, LOUISIANA, failed to show larvae in 282 pods inspected. In Texas, 12 larvae were found in 475 pods inspected in Cameron County, one in 3800 pods in Hidalgo County and none in 1300 pods in Willacy County. (PBW Cont. Prog., Dec., 1956). Seventeen live and 26 dead larvae found in 83 bolls from standing stalks in Tillman County. In 85 bolls in debris in Jackson County, three live and 27 dead larvae were found. (Fed.-State PBW Cont. Prog.).

FOREST, ORNAMENTAL AND SHADE TREE INSECTS

IPS BEETLES (*Ips* spp.) - TEXAS - Continuation of heavy mortality of pines in Harris, Liberty, Montgomery, Polk, San Jacinto and Walker Counties. Activity reported to be decreasing from serious proportions of previous three months. (Texas For. Pest Comm.).

PINE TORTOISE SCALE (*Toumeyella numismaticum*) - WEST VIRGINIA - Heavy infestation on 30 acres of Virginia pine in Mineral County. (Dorsey, Hansen, Gillespie).

A MITE (*Tarsonemus* sp.) - CALIFORNIA - Reported heavily infesting *Odontoglossum* orchids in Sharp Park, San Mateo County. (Cal. Coop.Rept., Jan. 18).

INSECTS AFFECTING MAN AND ANIMALS

CATTLE GRUBS - OKLAHOMA - Counts on 82 aged cows at an Oklahoma City slaughtering plant averaged 4.2 grubs per animal. (Coppock, Jan. 18). Counts on mature cows at El Reno averaged 4.9 grubs per animal with a range of 0-19. (Schomberg).

STORED PRODUCTS INSECTS

Khapra Beetle Progress Report
The cumulative treatment summary as of December 31, 1956 is as follows:

State	Tot. Inf. Sites	Tot. Vol. Cu. Ft.	Sites Treated & Released	Vol. Treated & Released	Methyl Br. Used in lbs.
Ariz.	139	57,657,759	103	35,317,183	306,184
California	281	76,005,000	260	72,482,378	577,289
N. Mexico	5	415,400	5	415,400	3,680
R. Mexico	40	11,630,000	26	7,970,169	61,404
Totals	465	145,708,159	394	116,185,130	950,557

(PPC, West. Reg.).

Khapra Beetle Survey in Southern Region, December: Inspections of various stored product sites in Arkansas, Mississippi, North Carolina, South Carolina and Texas showed no infestations. (PPC, So. Reg., Dec. 1-31).

Stored Grain Insects Situation in Oklahoma: A survey of 16 feed and seed houses in Woodward, Hayes, Beaver, Texas and Cimarron Counties showed the following infestations: INDIAN-MEAL MOTH light in five sites and medium to heavy infestations in two sites; light infestations of DERMESTIDS in six locations; a heavy infestation of LESSER GRAIN BORER in one location; heavy infestation of SAW-TOOTHED GRAIN BEETLE in one location; and a light infestation of CADELLE in one location. (Coppock).

PINK SCAVENGER CATERPILLAR (*Pyroderces rileyi*) - SOUTH CAROLINA - Causing serious injury to corn being unloaded at local elevator, Darlington. (Nettles, Newton, Dec. 4).

CIGARETTE BEETLE (*Lasioderma serricorne*) - WEST VIRGINIA - Heavy infestation in chewing tobacco in Kanawha County. (Dorsey, Hansen, Gillespie).

MISCELLANEOUS INSECTS

BROWN-BANDED ROACH (*Supella supellectilium*) - OREGON - Reported in considerable numbers in a Portland machine supply house, Jan. 16. (Capizzi).

CORRECTIONS

CEIR 7 (2): 17, KHAPRA BEETLE - CALIFORNIA - Last sentence should read "Seven sites are under contract...".

LIGHT TRAP COLLECTIONS	Pseud. unipun.	Agrotis ypsilon	Prod. orni.	Feltia subt.	Laphyg. frugip.	Perid marg.	Helio. zea
TEXAS							
College Station 1/20-24	4		5	3	3		1
FLORIDA							
Monticello 1/15-16		1	3	2			
Homestead 1/16				3			
Quincy 1/16	1			3			
Gainesville 1/23	3	2		15			

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CHANGES IN TROGODERMA NOMENCLATURE

In a recent article, "Synopsis of the economic species of *Trogoderma* occurring in the United States with description of a new species (Coleoptera:Dermestidae)," by R. S. Beal, Jr., in Ann. Ent. Soc. Amer. 49(6):559-566, 1956, the following three changes in species have been made:

1. *Trogoderma boron* Beal becomes *T. glabrum* (Herbst) (not *T. glabrum* according to Beal, 1954).

2. *T. glabrum* (according to Beal 1954) becomes *T. teukton* Beal, 1956.

3. *T. versicolor* (Creutz.) occurs on the continent of Europe, but not in North America. It is not the same species as the form which has gone under that name in America. The American species is properly *T. inclusum* LeConte.

This revised terminology is now being followed in the Cooperative Economic Insect Report.

SUMMARY OF INSECT CONDITIONS - 1956

INDIANA

Reported by J.J. Davis

As in 1955, major insect problems were fewer and of less importance than in normal years. In general, rainfall was ample until into September and thereafter conditions were unusually dry. Also temperatures throughout the year were below normal.

Field Crop Insects: GLASSY CUTWORM (Crymodes devastator) was more serious than for many years. Greatest damage was to corn in light sandy soils. Many thousands of acres of corn were destroyed in Starke, LaPorte and other northern counties. BLACK CUTWORM (Agrotis ypsilon) was widespread throughout the State, especially in muck areas, but not as serious as a few years back. EUROPEAN CORN BORER (Pyrausta nubilalis) overwintered in larger numbers than for several years, especially in central and northern areas. The first-generation larvae were very abundant in the early part of the growing season, but the population of borers dropped off rapidly so that the resulting number of adults were considerably smaller than was anticipated. Total damage by the corn borer in the State was light with a few scattered areas of moderately-severe damage to early-planted corn. Fall survey showed a low overwintering population. CORN EARWORM (Heliothis zea) was generally more abundant than in 1955 with heavy infestations in the southern area. SADDLEBACK CATERPILLAR (Sibine stimulea) was more abundant than usual during September, especially on corn. JAPANESE BEETLE (Popillia japonica) has become more abundant and widespread in distribution during 1956. In the area around Kentland adults were unusually numerous and destructive on soybeans. ALFALFA PLANT BUG (Adelphocoris lineolatus) was more abundant this year than usual. GRASSHOPPERS (principally Melanoplus mexicanus and M. femur-rubrum) were seriously destructive to cultivated crops, due in part to the succulence of native vegetation, the natural habitat of the insects. CHINCH BUG (Blissus leucopterus) did not materialize as pests, although it did winter over in moderate and threatening numbers. MEADOW SPITTLEBUG (Philaenus leucophthalmus) infestations continued moderately heavy and about normal. In 1956 there was virtually no spraying for spittlebug because of the low, early populations and the fact that most farmers had more hay and pasture than needed. ARMYWORM (Pseudaletia unipuncta) was not destructively abundant in Indiana this year. NORTHERN CORN ROOTWORM (Diabrotica longicornis) adults were common throughout the State but were unusually abundant and destructive to corn silks in the Vincennes area. CLOVER LEAF WEEVIL (Hypera punctata) was scarce during the spring months. SPOTTED ALFALFA APHID was reported for the first time in Indiana in 1956 by M. C. Wilson. It is believed this species first came into Posey County the latter part of August. By October 15 it had spread along the Wabash and Ohio Rivers into seven Indiana counties, as follows: Gibson, Knox, Perry, Posey, Spencer, Vanderburg, and Warrick. HESSIAN FLY (Phytophaga destructor) did not materialize as a pest as anticipated.

Vegetable Garden Insects: HORNWORMS (Protoparce spp.) were scarce on tomatoes and not as abundant as normally on tobacco along the Ohio River. They were late in appearing. SQUASH BUG (Anasa tristis) which has been abundant and destructive to commercial plantings the past few years, especially in southern Indiana, were rather scarce. BEAN LEAF BEETLE (Cerotoma trifurcata) was a common pest of garden beans and soybeans. This insect has been building up on soybeans for several years and in 1956 it was severe enough in some localities (Crawfordsville) to justify treatment. CABBAGE MAGGOT (Hylemya brassicae) was less abundant than normal. TOMATO FRUITWORM (Heliothis zea) was especially abundant on green and ripening tomatoes during September. In many fields the infestation was 15 to 20 percent, and canning plants throughout the State rejected many loads of infested fruit.

Tree Insects: BAGWORM (Thyridopteryx ephemeraeformis) continues to be the major pest of ornamental plantings and shade trees, and was so abundant that 1956 was considered the most severe year on record in Indiana. New infestations were reported in Starke and St. Joseph Counties. The hatching period was prolonged. ELM LEAF BEETLE (Galerucella xanthomelaena) infestations have been especially severe on Chinese elms with most inquiries coming from central and southern areas. Also, they have been a continuing household pest. ZIMMERMAN PINE MOTH (Dioryctria zimmermani) was found for the first time in Indiana in LaPorte County by D. L. Schuder. The insect was found infesting red and scotch pines. BRONZE BIRCH BORER (Agrilus anxius) was a serious pest to birches where new trees were planted and where drought conditions over the last two years were serious. MAPLE BLADDER-GALL MITE (Vasates quadripes) was common throughout the State. JUNIPER WEBWORM (Dichomeris marginella) was reported as heavily infesting junipers in a number of localities, mostly from central area. MIMOSA WEBWORM (Homadaula albizziae) was reported as heavily infesting honeylocust in Indianapolis area. EUROPEAN PINE SAWFLY (Neodiprion sertifer) has been normally abundant on red and scotch pine plantings in northern areas. Don Schuder reports excellent results from the artificial use of the virus disease which he introduced into Indiana several years ago. RED-HEADED PINE SAWFLY (Neodiprion lecontei) has been destructively abundant on pine in southern area. YELLOW-NECKED CATERPILLAR (Datana ministra) and RED-HUMPED CATERPILLAR (Schizura concinna) were abundant on various trees, especially those of the apple group.

Household and Miscellaneous Pests: COCKROACHES continue as the major household pest. Although several species are involved the ORIENTAL ROACH (Blatta orientalis) is the major problem. CLOVER MITE (Bryobia praetiosa) continues as a major annoyance in homes in the spring and fall. As observed in the past, the infestations develop in new lawns as a rule. BOX-ELDER BUG (Leptocoris trivittatus) and ELM LEAF BEETLE (Galerucella xanthomelaena) have become more or less annual pests in many parts of the State, entering homes in the fall. ANTS of various species caused many complaints, perhaps the majority coming in the fall of the year and mistaken for termites. However, many inquiries have referred to ants in the home and as reported a year ago, especially in slab-constructed homes. APHIDS on trees, especially elm trees, have been commonly annoying because of the "honeydew" produced. CARPET BEETLES, especially the BLACK CARPET BEETLE (Attagenus piceus) was reported repeatedly from all parts of the State. Few reports of the CLOTHES MOTHS were received. CLICK BEETLES (Melanotus spp.) were again reported abundant and annoying in homes. Many reports of damage by POWDER POST BEETLES (Lyctus spp.) were received during the year. In many cases they were mistaken for termites. During the year to date, 115 letters were received regarding the control of EASTERN SUBTERRANEAN TERMITE (Reticulitermes flavipes). These pests are the number one building problem. Reports of damage to underground cable were received from the northwestern part of the State. Mr. T. E. Snyder verified the cause of the damage. Infestations of a rotten-wood TERMITE (Zootermopsis angusticollis) was reported September 6, in Douglas-fir in a shipment of lumber from Tillonosh, Oregon to a lumber company in Anderson, Indiana. Several species of MILLIPEDES have been reported to be abundant in lawns around homes during the dry weather, such infestations usually occurring adjacent to wooded areas.

SUMMARY OF INSECT CONDITIONS - 1956

OKLAHOMA

Reported by Stanley Coppock

Highlights: Severe damage by the SPOTTED ALFALFA APHID occurred in most sections. Some fields in central counties were completely destroyed. A heavy general infestation of GRASSHOPPERS occurred throughout the State. Extensive spraying with good control took place in the western part. ARMY CUTWORM did considerable damage to small grains in several western counties. GREENBUGS damaged small grains in scattered areas, the northeastern counties being hardest hit. PECAN NUT CASEBEARER damage was heavy in all commercial sections. SQUASH BUG populations were abnormally high, causing damage to cucurbits in all areas. CORN EARWORM populations on corn and sorghums were widespread and heavier than in 1955; sweet corn plantings were especially damaged. BOLL WEEVIL damage was especially light to upland cotton in the western part of the State while in eastern areas and the western irrigated sections damage was generally light-moderate. BOLLWORM infestations were generally light on upland cotton in all areas and heavy in isolated fields of irrigated cotton. Late winter (1955-1956) surveys indicated no PINK BOLLWORM overwintering survival east of the 97th meridian. LESSER GRAIN BORER populations were the heaviest on record for most eastern counties. CATTLE GRUB infestations were heavy-severe in all sections during the 1955-1956 season.

Cereal and Forage Insects: CORN EARWORM (Heliothis zea) populations on corn and sorghums were widespread and heavier than in 1955. Whorl infestation rate in field corn ran as high as 95 percent and better by mid-June. Late ear infestations were approximately 100 percent. Reduction in yield by earworm ran 14 percent at Nowata. The number of corn earworm eggs per ear at Stillwater averaged 44.6 for the season compared with 23.9 for 1955. Throughout August and September light damage to sorghum heads was reported in Woodward, Ottawa, and the Panhandle Counties. EARWORM populations in alfalfa became common in southwestern and a few northeastern counties during August and early September. ARMY CUTWORM (Chorizagrotis auxiliaris) populations began damaging wheat and other small grains around February 15 in the western one-half of the State. Peak injury occurred in early March and was heaviest in Major, Blaine, and Kingfisher Counties. Control by spraying was generally unsatisfactory. By April 20, most larvae had pupated. BROWN WHEAT MITE (Petrobia latens) was common in wheat throughout the western one-half of the State at the beginning of the year. Peak injury occurred during March with counts 100-150 per linear foot of row. By mid-April, the advanced growth of the wheat prevented further damage. Extension of the range was noted as far east as Tulsa and Washington Counties. On May 15, mites were actively feeding on alfalfa in Texas County and diapause eggs were common. GREENBUG (Toxoptera graminum) caused economic damage in winter wheat and barley in extreme northeastern counties in late February. Later, isolated outbreaks occurred in wheat in southwestern and west central counties, including Tillman, Kiowa, Commanche, Grady, Canadian, Caddo, and Garvin. Some fields of winter barley and spring oats in the northeastern section suffered severe to total damage. By April 20, economic infestations in western Oklahoma had disappeared. Spraying was generally successful. Light populations of CHINCH BUG (Blissus leucopterus) were noted in wheat in extreme northeastern counties April 13. Heavy numbers in isolated fields of sorghums and corn occurred throughout July, August and September. The 1956 Fall Chinch Bug Survey showed 10 of the 19 northeastern counties surveyed have a potential rating of severe-very severe. SOUTHWESTERN CORN BORER (Zeadiatraea grandiosella) populations were somewhat lower than last year. Stalk infestations in west-central counties generally ran 3-10 percent. ALFALFA WEBWORM (Loxostege commixtalis) larvae were abundant in isolated fields of southern and southwestern counties in June, July, and August. Damage was light to moderate. FALL ARMYWORM (Laphygma frugiperda) populations in alfalfa were light and restricted largely to western and southern counties. CORN LEAF APHID (Rhopalosiphum maidis) was extremely heavy on sorghums in scattered fields of all sections, but decreased in July and August due to dry weather. Damage, if any, was very light. A LEAFHOPPER (Aceratagallia uhleri) built up in alfalfa to abundant numbers in many southern and eastern counties by June 1. VETCH BRUCHID (Bruchus brachialis) was very common throughout May in vetch fields of southern counties. Damage was light to moderate. CORN FLEA BEETLE (Chaetocnema pulicaria) infestations did light damage to corn seedlings in restricted areas of eastern and southern counties. POTATO LEAFHOPPER (Empoasca fabae) adults were first noted in Payne County, May 11 and by May 25 the first locally-developed generation was apparent. Statewide populations were very light. FALSE WIREWORM (Eleodes sp.) populations were lighter than last year with no economic damage noted. BLISTER BEETLES (Epicauta spp.) were common and widespread in alfalfa throughout the State during July and August. PEA APHID (Macrosiphum pisi)populations were non-economic. A heavy general infestation of GRASSHOPPERS occurred throughout the State with extensive damage in many areas to cotton, corn, alfalfa, sorghum, and rangeland. Nymphal populations in Texas County were reduced in May due to dry, hot winds and lack of available food supply. Nymphal populations were especially heavy in Ellis County rangeland with 30 or more per square yard common. Most abundant crop species in eastern areas were *Melanoplus differentialis*, *M. bivittatus*, and *M. femur-rubrum*, while *Ageneotettix deorum* and *Mermiria* sp. were the most common range species in the east. In the western and southwestern sectors the most abundant rangeland and roadside grasshoppers were *A. deorum*, *M. differentialis*, *M. packardii*, and *Phlibostroma quadrimaculatum*. Approximately 250,000 acres of western rangeland were sprayed in the Cooperative State - Federal Spray Program with control good to excellent. The annual fall egg survey November 1956 showed consistently low egg-deposition for most areas. SPOTTED ALFALFA APHID damage was much heavier than in 1955. Severe damage occurred in all sections except perhaps a few areas in the southwest and west. Infestations became severe in the southern and east-central counties late in February and spread rapidly to the central and northeastern commercial areas.Most of the damage occurred during March and April. By May, most areas had low populations. Heaviest damage centered in Garvin County where many fields were partially or completely destroyed. Extended drought conditions held infestations in all sections to non-economic rates through the remainder of the summer and fall. Exceptions were noted in southwestern irrigated fields and a few sub-irrigated fields elsewhere. At the year's end populations in many areas, especially in the northern and northeastern counties, were increasing rapidly due to recent rains and subsequent growth of alfalfa.

Fruit Insects: PECAN NUT CASEBEARER (*Acrobasis caryae*) damage was heavy in all sections. In some local areas, the pecan crop was a near failure due to larval damage. By May 1, the overwintering brood had caused considerable damage in central counties. Surveys during June in southern and central counties showed 5-96 percent damage and less in other sections. WALNUT CATERPILLAR (*Datana integerrima*) damage was light. FALL WEBWORM (*Hyphantria cunea*) was heavy in east-central counties in July. Damage to pecans was light-moderate. Many young persimmon trees in Pontotoc and Hughes Counties were completely defoliated. Damage by PLUM CURCULIO (*Contrachelus nenuphar*) was practically non-existent. CODLING MOTH (*Carpocapsa pomonella*) damage was the lightest in several years. GREEN JUNE BEETLE (*Cotinis nitida*) damaged ripe peaches in the central area during July and August. Heavy local infestation of WOOLLY APPLE APHID (*Eriosoma lanigerum*) on apples occurred in eastern area, during June. A COCCID (*Neostiengelia texana*) was common on pecans throughout June and July in several eastern and southern counties.

Truck Crop Insects: Subterranean populations of SEED-CORN MAGGOT (*Hylemya cilicrura*) were abnormally high on early spinach during the spring in the Bixby area. Up to 5 percent foliage infestation there in the autumn. Several species of BLISTER BEETLES became quite abundant during June in the central and eastern sections damaging tomato, potato and bean plantings; later becoming common in all sections. Principal species were *Epicauta immaculata* and several other species of *Epicauta*. SQUASH BUG (*Anasa tristis*) populations were abnormally high and occurred throughout all sections. Moderate-severe damage to melons and squash in the Rush Springs and Tulsa-Bixby areas was noted. MELON APHID (*Aphis gossypii*) caused light-severe damage in scattered fields in the south-central melon-producing areas and was light in all other sections. CORN EARWORM (*Heliothis zea*) was moderate on early-planted sweet corn throughout the State. GREEN PEACH APHID (*Myzus persicae*) was generally light but heavy in spinach in the Bixby area early in season. SOUTHERN BEET WEBWORM (*Pachyzancla bipunctalis*) infested up to 13 percent of spinach in the Arkansas River Valley in fall. TOMATO HORNWORM (*Protoparce quinquemaculata*) was common in all vegetable-growing areas with damage generally light to moderate. An outbreak of FALSE CHINCH BUG (*Nysius ericae*) severely damaged several fields of spinach and radishes in the Bixby area. CABBAGE LOOPER (*Trichoplusia ni*) caused up to 10 percent damage to head cabbage in Tulsa and Muskogee Counties during May and early June. WEBWORMS (*Loxostege* spp.) defoliated several fields of black-eyed peas near Altus. A TORTOISE BEETLE (*Agroiconota bivittata*) larvae and adults caused heavy foliage damage to sweetpotatoes in scattered areas of eastern section. Up to 25 WIREWORMS (unidentified) per 100 sweet corn seedlings were noted in the El Reno vicinity.

Cotton Insects: BOLL WEEVIL (*Anthonomus grandis*) damage was especially light in the western part of the State during 1956, due largely to lack of moisture. Early infestation counts in sprayed areas of eastern Oklahoma typically ran 0-10 percent, in the west 0-6 percent. It was impossible to find punctured squares in most western fields of upland cotton during July and August. A sharp increase was noted during late July and August. At the same time western irrigated fields had infestation counts up to 25 percent, however the average was much lower. BOLLWORM (*Heliothis zea*) infestations were generally light on upland cotton in all areas and generally heavy in fields of irrigated cotton. A sharp increase in egg deposition in southwestern counties was noted in late July and continued so throughout the rest of the season. Infestation and resultant boll damage was light in eastern sections. Extensive persistent control measures in western, irrigated fields minimized damage. PINK BOLLWORM (*Pectinophora gossypiella*) populations were generally light in the western part and somewhat heavier in central and eastern sections. Late winter debris samplings in all eastern counties showed no overwintering survival east of the 97th meridian. In October larvae were taken at a gin stand in McCurtain County, a new county record. COTTON FLEAHOPPER (*Psallus seriatus*) was light in early counts in most sections except in isolated fields of the southwest. Tillman County populations in late July ran 7-68 percent of terminals infested. Late infestations were generally light in all sections. THRIPS were not abundant in any section during 1956. COTTON APHID (*Aphis gossypii*) populations were low to non-existent in most sections, however, this species became common in some southwestern fields during August. Populations of CABBAGE LOOPER (*Trichoplusia ni*) became very heavy in many irrigated fields of the south-central, southeastern and southwestern counties during August. From 2-20 larvae per plant were common in many fields with foliage damage light-moderate. Spraying did not give good control of mature larvae. SPIDER MITES (*Tetranychus* spp.) infestations were light generally with the exception of heavy, isolated populations in a few southwestern irrigated fields. COTTON LEAFWORM (*Alabama argillacea*) populations were unusually low in all sections.

Stored Products Insects: RICE WEEVIL (*Sitophilus oryza*) infestations were heaviest in farm-stored grain in the eastern counties. Damage was heavy in a few premises. A very heavy infestation with severe damage was reported from a grain warehouse in Logan County. LESSER GRAIN BORER (*Rhyzopertha dominica*) populations were heaviest on record for most eastern counties. Heavy damage occurred to 1955 stored crops, especially wheat and barley. Control was inadequate in many instances. Western counties had isolated heavy populations also. SAW-TOOTHED GRAIN BEETLE (*Oryzaephilus surinamensis*) populations were present in most farm-stored grain surveyed in all sections of the State with heavy populations in some eastern areas. CONFUSED FLOUR BEETLE (*Tribolium confusum*) and RED FLOUR BEETLE (*T. castaneum*) showed scattered light to heavy infestations in mills, warehouses and farm-stored grain in all sections. A survey of stored peanuts in central Oklahoma in September showed INDIAN-MEAL MOTH (*Plodia interpunctella*) and the MEDITERRANEAN FLOUR MOTH (*Anagasta kuhniella*) infestations to be widespread and serious with an estimated 10 percent of the peanuts heavily damaged. FLAT GRAIN BEETLE (*Laemophloeus pusillus*) populations were generally very light. Light, scattered infestations of CADELLE (*Tenebroides mauritanicus*) and BLACK CARPET BEETLE (*Attagenus piceus*) were noted. During June heavy populations of BOOK LOUSE (*Liposcelis divinatorius*) were present in stored grain in Oklahoma and Payne Counties.

Insects Affecting Man and Animals: COMMON CATTLE GRUB (*Hypoderma lineatum*) infestations were reported as heavy to severe in all sections during the 1955-56 season. Most grubs had emerged by the end of February. Fall 1956 infestations occurred later than usual and somewhat lighter than the previous year. The first report of heel fly activity was in Okfuskee County, March 28. HORN FLY (*Siphona irritans*) populations were scattered but heavy, early in the season on untreated animals. Mid-summer populations were reduced considerably, especially in the western part. Populations of TABANIDS were lighter than usual in all sections. Exceptions were high numbers of *Tabanus abactor* and *T. lineola* in a few eastern counties during

July. Late summer larval counts on all tabanids except *T. atratus* were very low in the central area. MOSQUITOES, especially *Psorophora* spp., were abundant in central and eastern areas in June. CATTLE TICK populations of *Ixodes ricinus scapularis* and *Amblyomma americanum* were generally low in all areas. Throughout July and August the above two species averaged 3-10 per animal in Muskogee and surrounding counties. EAR TICK (*Otobius megnini*) was common in western areas and its range extended eastward some during the year. BROWN DOG TICK (*Rhipicephalus sanguineus*) became numerous in Comanche County during autumn. Populations of SCREW-WORM (*Callitroga hominivorax*) were unusually low. STABLE FLY and SUCKING LICE infestations were lower than average. LITTLE HOUSE FLY (*Fannia canicularis*) was more numerous in the central area than any time during the past 10 years.

Forest, Ornamental and Shade Tree Insects: IPS BEETLE infestation was light but serious. Species included *Ips avulus*, *I. calligraphus* and *I. grandicollis*. A LEAF ROLLER (*Fascista cercerisella*) did extensive damage to redbud trees in all sections. BAGWORMS were common to very abundant in all areas of the State. FLAT-HEADED BORER (*Chrysobothris femorata*) damage was evident in many shelterbelt elms in the western part. WOOLLY ELM APHID (*Eriosoma americanum*) and the ELM LEAF APHID (*Myzocallis ulmifolii*) were numerous and damaging in isolated eastern sections. A heavy infestation of the ELM CALLIGRAPHA (*Calligrapha scalaris*) occurred on native elm in the Oklahoma City area during August. During May and June a SCALE INSECT (*Kermes pubescens*) was numerous on southern red oak in the Wewoka area and in Caddo County. A TULIP APHID (*Rhopalosiphoninus tulipaella*) became numerous during April on tulips in Muskogee County and on iris in Payne County.

Beneficial Insects: Heavy populations of LADY BEETLES (*Hippodamia convergens*) followed the spotted alfalfa aphid build-up in most sections. With a reduction in aphid numbers lady beetles likewise declined. LACEWINGS (*Chrysopa* spp.) became numerous in alfalfa during late summer in many sections. Various species of COLLOPS BEETLES in alfalfa generally ranged from 12-40 per 10 sweeps for central and southern counties during August.

STATUS OF SPOTTED ALFALFA APHID - 1956

Spotted alfalfa aphid was first reported in the United States in the spring of 1954 from New Mexico. By the end of 1955 this destructive pest had reached the Mississippi River and in early 1956 it was collected in northern Florida. As of January 1, 1957, the aphid was known in 30 States (see map). It has been said that this species has shown the greatest rate of spread of any pest ever introduced into the United States.

Highlights of Infestations in 1956:

During January, infestations developed in areas of California, Nevada, Arizona, New Mexico, Texas, Arkansas and southern Utah. These infestations continued to develop during February showing increases in Nevada and Texas and causing early damage to alfalfa in Oklahoma. In April and early May heavy or damaging infestations built up in southwestern Utah, southern New Mexico, northern and east central Texas, southeastern Kansas and southwestern Missouri. Continued severe infestations prevented a first cutting in several counties in Oklahoma. During the latter part of May populations were generally low in the southwest and other areas. Spotted damage and fluctuating populations were reported during June and through early July with a gradual increase of the insect to destructive numbers in several counties of Utah, Arizona, New Mexico, Colorado and southeastern Missouri. The pest did not occur in widespread, damaging proportions during August except in Utah. In early September up to 30,000 aphids per 100 net sweeps were collected in Weld County, Colorado. Very severe populations developed in Bossier Parish, Louisiana; Dona Ana County, New Mexico; and several Colorado counties in September. Within the following weeks heavy damage occurred in some fields in southwestern Missouri, east central Kansas and southwestern Illinois, and extensive damage was recorded in southeast Nebraska. As late as November, heavy populations were reported from areas of Nebraska and Kansas. In late December the aphid was still being found in the southern half of Illinois. Only spotted local damage was reported from States east of the Mississippi River during the year.

Some Factors Influencing Development and Distribution

Mild winters and wind seem to favor development and spread of infestations. In Arkansas and Oklahoma weather conditions favor infestations in late fall and early spring in that they are cool enough to retard or stop predator activity but warm enough for aphid development. Prevailing southerly winds help spread the insect northward in Nebraska and Missouri. Mild winters allow overwintering in the southern areas of the latter State. Wind is also a factor in dispersal in Colorado Utah, New Mexico, Nevada and Oklahoma. The year-around growing season and overlapping crops are major influences on development of infestations in Arizona.

Increased Costs of Alfalfa Production

The reduction of alfalfa acreage due to the spotted alfalfa aphid varied from none to slight in most States to considerable in Oklahoma. A fifty percent reduction in acreage was reported in Texas, but this was a combination of dry weather and aphid damage. The estimated loss in yield in Oklahoma was established at 25 percent of the total production which is estimated at 995,400 tons. This compares with 10 percent of 977,000 tons in 1955. The additional costs to produce alfalfa hay per ton in treated areas varied from less than a dollar to over $7.50 depending on the number of treatments required and the percentage of crop lost. Cost estimates were as follows: New Mexico, $.75 - 4.50; Utah, 1.50-2.00; Nevada, 2.00; Oklahoma 7.50; Arizona, 2.50; Arkansas, 2.00-2.50; Missouri, 1.50-1.75.* California listed additional cost of $1.75 to $3.00. The principal materials used to control the aphid on alfalfa hay crops was reported to be malathion and parathion.

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*Missouri estimates for spotted alfalfa aphid and pea aphid combined.

ESTIMATES OF LOSSES BY SPOTTED ALFALFA APHID
(Dollar Value)

State	1954	1955	1956
Arizona	$ 500,000 1/	$ 2,500,000	$ 2,500,000
California	337,000 1/	13,000,000 2/	10,500,000 2/
Colorado	-	-	1,350,180
Kansas	2,500	2,400,000 3/	8,500,000 3/
Missouri	-	-	641,585
Nebraska	-	845,000 4/	3,144,000 4/
Nevada	-	163,000	225,000
New Mexico	4,000,000 1/	2,500,000	2,000,000
Oklahoma	-	2,225,000	6,500,000
Texas	-	10,000,000 3/	6,000,000 3/
Utah	-	780,000	500,000
	$4,339,500	$34,413,000	$41,860,765

1/ The Yellow Clover Aphid on Alfalfa. CEIR 5(2), 1955.
2/ Includes treatment costs.
3/ Losses based upon reduction in alfalfa due to aphid damage and drought conditions combined.
4/ Losses based entirely on hay crop.

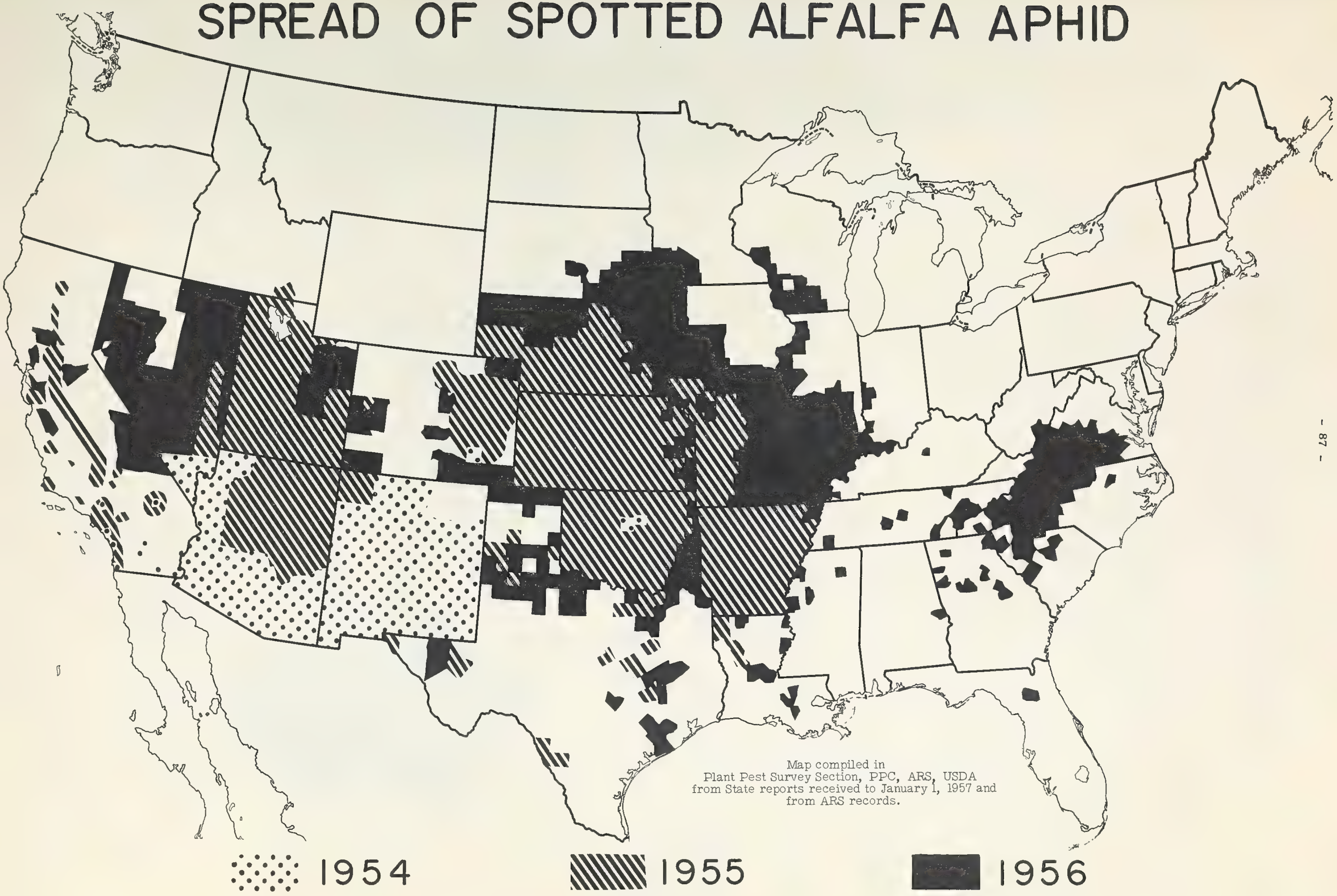
Status of biological control

In general, natural enemies were of considerable value in controlling the spotted alfalfa aphid. Coccinellids, nabids, chrysopids and syrphids were the most often reported predators of the aphids and were numerous in several States. Fungus diseases decreased populations and proved of some value in Missouri, Arkansas and Arizona as well as California. In California, coccinellids were responsible for widespread control assistance and predators increased in the central valleys and northern area infestations. Extremely promising in California are the imported hymenopterous parasites: *Praon palitans*, *Trioxys utilis* and to some degree, *Aphelinus semiflavus* (CEIR 6(46):1059). Generally, natural enemies have assisted greatly in controlling the aphid in Arizona; convergent lady beetle was effective and more helpful than in 1954 and 1955. Beneficial insects increased too late to control medium to heavy infestations in New Mexico and to prevent severe economic loss in Oklahoma, but they were effective during the summer in the latter State. In Texas, spring weather favored early build-up of natural enemies. High aphid populations were reduced in May in this State. The aphid was eliminated in some fields in Nebraska near the end of the season by lady beetle populations as high as 40 per square foot. When conditions are favorable for the aphid in Arkansas, natural control will not prevent continued build-up. A rapid aphid build-up was delayed by predators in 1956 in Nevada. In Louisiana, natural control agents were effective except in early spring and in late summer.

Outlook

It is not anticipated that economic populations will develop on the first alfalfa crop in northern Nevada counties. Acreage loss in principal alfalfa-producing counties cannot be evaluated until spring of 1957. Losses to fall-seeded fields in Nebraska may be more evident in the spring. Severe late infestations in the Shreveport area of Louisiana will probably affect the stands in 1957. Observations in Oklahoma indicate the spotted alfalfa aphid will probably be a serious pest during the cooler periods of the year, but may be expected to cause only minor loss during the warmer months. (Compiled in Plant Pest Survey Section from special State reports and ARS records). CEIR 7 (5), 2/1/57.

SPREAD OF SPOTTED ALFALFA APHID



Map compiled in
Plant Pest Survey Section, PPC, ARS, USDA
from State reports received to January 1, 1957 and
from ARS records.

INSECTS NOT KNOWN TO OCCUR IN THE UNITED STATES

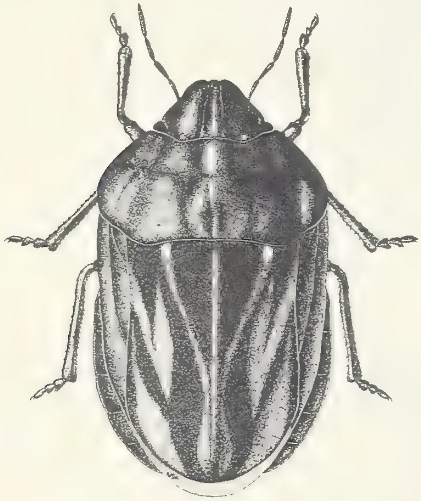
SENN PEST (Eurygaster integriceps Puton)

Economic Importance: This pentatomid is one of the most destructive pests of grain in the Near East. Main damage to the grain is two-fold: adults feed on stems of young plants and later adults and nymphs attack the kernels. The former damage often amounts to loss of over 25 percent of stand in non-irrigated fields while attack on kernels, by no more than two to three insects per square yard, can cause total loss of crop. Another type of damage is caused by introduction of enzymes into the grain which lower the baking quality of the flour. Although losses caused by this insect vary over the region, they are seldom less than 25 percent of the crop. It has been said that the pest causes more damage than grasshoppers in Iraq in some seasons. In Iran, during periods when the entire wheat crop was destroyed, the inhabitants were forced by famine to move from one part of the country to another. Heavy damage is reported from some areas of Russia. According to a survey carried out in Turkey in 1956, as many as 1.5 million hectares of cereals were infested by the senn pest.

Distribution: Afghanistan, Crete, Greece, Iran, Iraq, Israel, Jordan, Lebanon, Pakistan, Syria, Turkey, USSR.

Hosts: Wheat, barley, rye, oats, millet, sorghum, spurge, sunflower, flax, clover and thistle are included among the host plants.

Life History and Habits: Overwintering bugs hibernate in the soil around the roots of grasses in hill sections and under litter in valleys, then migrate to fields in the spring. The female lays up to 180 eggs, as a rule, very close to the ground on leaves and stems of host plants and also on non-graminous weeds. Hatching occurs in 10-12 days. By the end of June nearly all the new generation have reached the adult stage. There is only one generation a year.



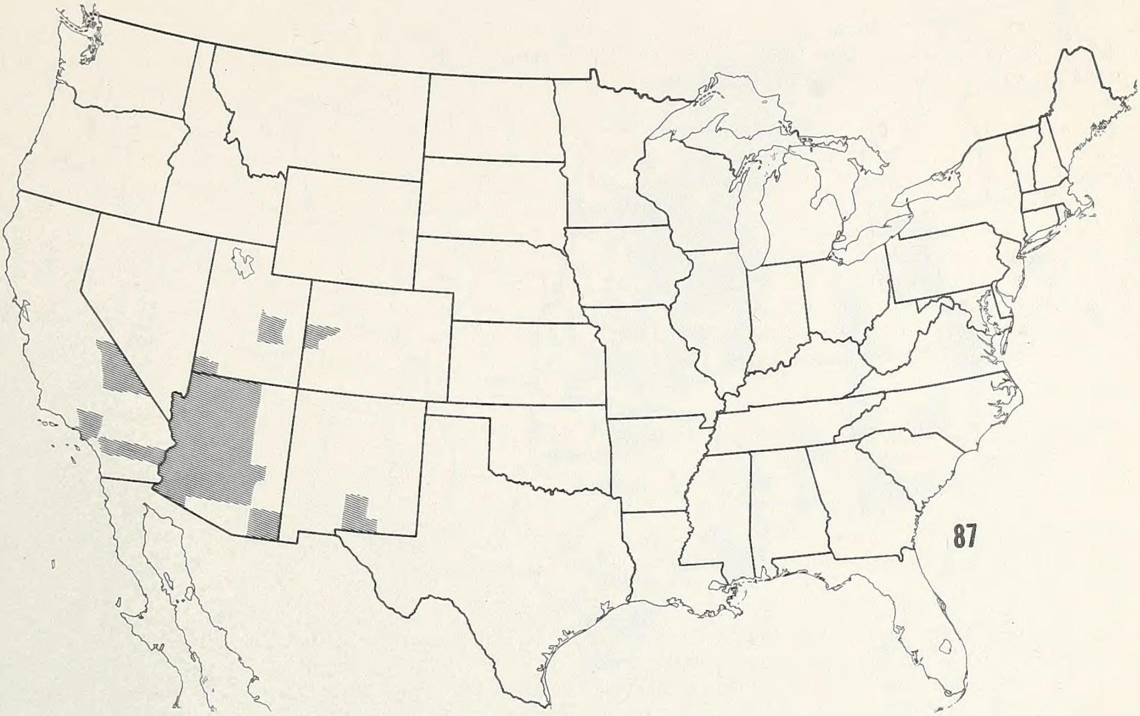
Adult greatly enlarged
(after Vodjdani)

Description: Length 11-12 mm. Body oval, convex above, yellowish brown with small black spots usually arranged into a pattern of linear markings. Head triangular, rounded in front, broader than long and with 2 longitudinal parallel grooves. Scutellum very large, longer than abdomen which it almost entirely covers. A calloused yellow line runs along 2/3 of mid line of scutellum. Base of scutellum has 2 raised yellow spots. Exposed dorsal margins of abdomen shows alternating light and dark areas. Ventral surface of body pale except for black spot at apex of scent gland canal. Tarsi with 3 joints, the second much smaller than the others. Antennae 5 segmented, last two segments darkened. (Prepared in Plant Pest Survey Section in cooperation with other ARS agencies).

February 1, 1957

DISTRIBUTION OF RANGE GRASSHOPPERS

Melanoplus yarrowii (Thomas)



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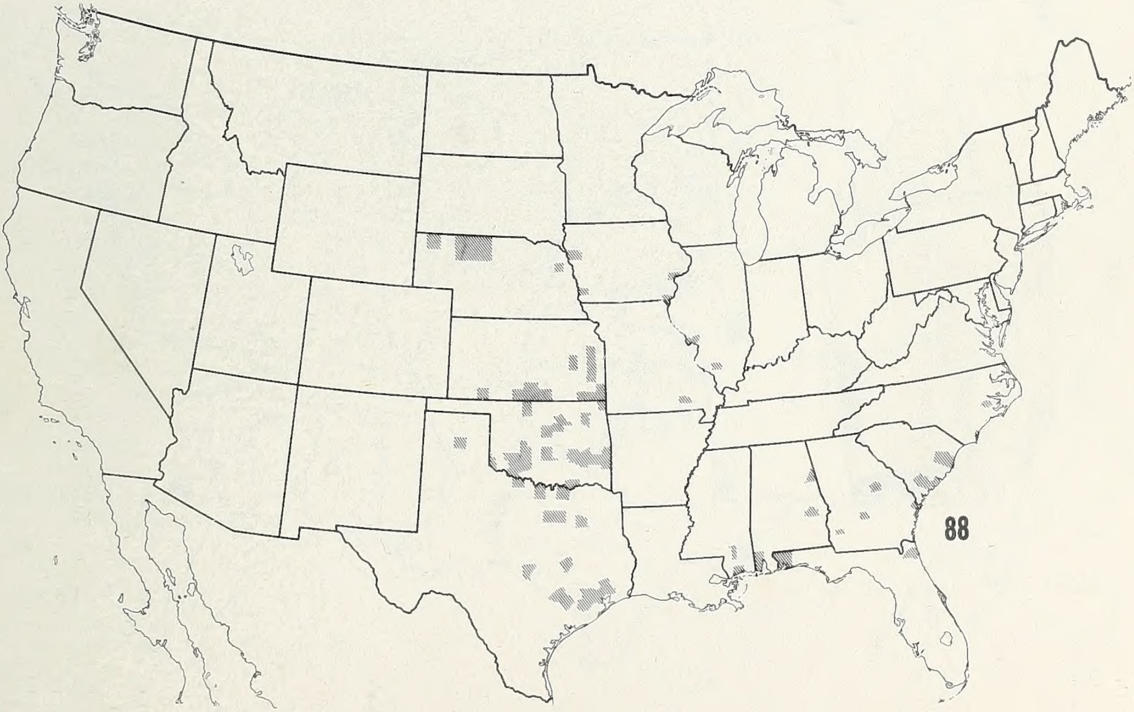
Mermiria bivittata (Serville)



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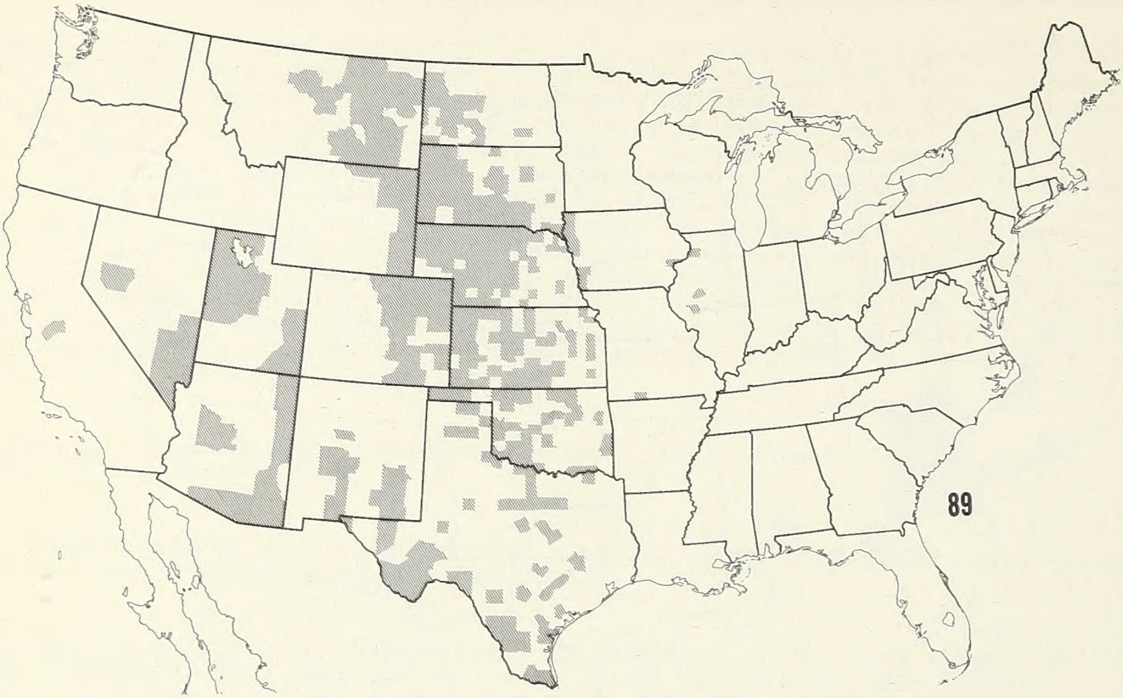
DISTRIBUTION OF RANGE GRASSHOPPERS

Mermiria maculipennis Bruner



Mermiria neomexicana (Thomas)